

Union Calendar No. 256

110TH CONGRESS
1ST SESSION

H. R. 3776

[Report No. 110–402]

To provide for a research, development, and demonstration program by the Secretary of Energy to support the ability of the United States to remain globally competitive in energy storage systems for vehicles, stationary applications, and electricity transmission and distribution.

IN THE HOUSE OF REPRESENTATIVES

OCTOBER 9, 2007

Mr. GORDON of Tennessee introduced the following bill; which was referred to the Committee on Science and Technology

OCTOBER 22, 2007

Reported with amendments, committed to the Committee of the Whole House on the State of the Union, and ordered to be printed

[Strike out all after the enacting clause and insert the part printed in *italie*]

[For text of introduced bill, see copy of bill as introduced on October 9, 2007]

A BILL

To provide for a research, development, and demonstration program by the Secretary of Energy to support the ability of the United States to remain globally competitive in energy storage systems for vehicles, stationary applications, and electricity transmission and distribution.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 **SECTION 1. SHORT TITLE.**

4 *This Act may be cited as the “Energy Storage Tech-*
5 *nology Advancement Act of 2007”.*

6 **SEC. 2. DEFINITIONS.**

7 *For purposes of this Act—*

8 (1) *the term “Department” means the Depart-*
9 *ment of Energy;*

10 (2) *the term “electric drive vehicle” means—*

11 (A) *a vehicle that uses an electric motor for*
12 *all or part of its motive power, including battery*
13 *electric, hybrid electric, plug-in hybrid electric,*
14 *fuel cell, and plug-in fuel cell vehicles, and rail*
15 *transportation vehicles; or*

16 (B) *mobile equipment that uses an electric*
17 *motor to replace an internal combustion engine*
18 *for all or part of the work of the equipment;*

19 (3) *the term “islanding” means a distributed*
20 *generator or energy storage device continuing to*
21 *power a location in the absence of electric power from*
22 *the primary source;*

23 (4) *the term “microgrid” means an integrated*
24 *energy system consisting of interconnected loads and*
25 *distributed energy resources, including generators and*

1 *energy storage devices, which as an integrated system*
2 *can operate in parallel with the utility grid or in an*
3 *intentional islanding mode;*

4 (5) *the term “Secretary” means the Secretary of*
5 *Energy;*

6 (6) *the term “self-healing grid” means a grid*
7 *that is capable of automatically anticipating and re-*
8 *sponding to power system disturbances, including the*
9 *isolation of failed sections and components, while op-*
10 *timizing its own performance and service to cus-*
11 *tomers; and*

12 (7) *the term “spinning reserve services” means*
13 *an amount of electric generating capacity in excess of*
14 *the amount needed to meet peak electric demand.*

15 **SEC. 3. BASIC RESEARCH PROGRAM.**

16 (a) *IN GENERAL.*—*The Secretary shall conduct a basic*
17 *research program to support the development of energy stor-*
18 *age systems for electric drive vehicles, stationary applica-*
19 *tions, and electricity transmission and distribution, includ-*
20 *ing research on—*

21 (1) *materials design;*

22 (2) *materials synthesis and characterization;*

23 (3) *electrolytes;*

24 (4) *surface and interface dynamics;*

25 (5) *modeling and simulation; and*

1 (6) *thermal behavior and life degradation mecha-*
 2 *nisms.*

3 (b) *FUNDING.*—*For activities carried out under this*
 4 *section, in addition to funding activities at National Lab-*
 5 *oratories, the Secretary shall award funds to, and coordi-*
 6 *nate activities with, a range of stakeholders including the*
 7 *public, private, and academic sectors.*

8 (c) *AUTHORIZATION OF APPROPRIATIONS.*—*There are*
 9 *authorized to be appropriated to the Secretary for carrying*
 10 *out this section \$50,000,000 for each of the fiscal years 2009*
 11 *through 2014.*

12 **SEC. 4. APPLIED RESEARCH PROGRAM.**

13 (a) *IN GENERAL.*—*The Secretary shall conduct an ap-*
 14 *plied research program on energy storage systems to sup-*
 15 *port electric drive vehicle, stationary application, and elec-*
 16 *tricity transmission and distribution technologies, includ-*
 17 *ing research on—*

18 (1) *ultracapacitors;*

19 (2) *flywheels;*

20 (3) *batteries and battery systems (including flow*
 21 *batteries);*

22 (4) *compressed air energy systems;*

23 (5) *power conditioning electronics;*

24 (6) *manufacturing technologies for energy stor-*
 25 *age systems;*

1 (7) *thermal management systems; and*

2 (8) *hydrogen as an energy storage medium.*

3 (b) *FUNDING.—For activities carried out under this*
4 *section, in addition to funding activities at National Lab-*
5 *oratories, the Secretary shall award funds to, and coordi-*
6 *nate activities with, a range of stakeholders including the*
7 *public, private, and academic sectors.*

8 (c) *AUTHORIZATION OF APPROPRIATIONS.—There are*
9 *authorized to be appropriated to the Secretary for carrying*
10 *out this section \$80,000,000 for each of the fiscal years 2009*
11 *through 2014.*

12 **SEC. 5. ENERGY STORAGE SYSTEMS DEMONSTRATIONS.**

13 (a) *IN GENERAL.—The Secretary shall carry out a*
14 *program of new demonstrations of advanced energy storage*
15 *systems. These demonstrations shall be regionally diversi-*
16 *fied and shall expand on the Department’s existing tech-*
17 *nology demonstration program. These demonstrations*
18 *should include the participation of a range of stakeholders,*
19 *such as rural electric cooperatives, investor owned utilities,*
20 *municipally owned electric utilities, energy storage systems*
21 *manufacturers, electric drive vehicle manufacturers, the re-*
22 *newable energy production industry, State or local energy*
23 *offices, the fuel cell industry, and universities. Each of the*
24 *demonstrations shall include one or more of the following*
25 *objectives:*

1 (1) *Energy storage to improve the feasibility of*
2 *“micro-grids” or “islanding”, or the transmission*
3 *and distribution capability to improve reliability in*
4 *rural areas.*

5 (2) *Integration of an energy storage system with*
6 *a self-healing grid.*

7 (3) *Use of energy storage to improve security to*
8 *emergency response infrastructure.*

9 (4) *Integration with a renewable energy produc-*
10 *tion source, either at the source or away from the*
11 *source.*

12 (5) *Use of energy storage to provide ancillary*
13 *services, such as spinning reserve services, for grid*
14 *management.*

15 (6) *Advancement of power conversion systems to*
16 *make them smarter, more efficient, able to commu-*
17 *nicate with other inverters, and able to control volt-*
18 *age.*

19 (7) *Use of energy storage to optimize trans-*
20 *mission and distribution operation and power qual-*
21 *ity, which could address overloaded lines and mainte-*
22 *nance of transformers and substations.*

23 (8) *Use of advanced energy storage for peak load*
24 *management of homes, businesses, and the grid.*

1 (9) *Use of energy storage devices to fill up*
 2 *nonpeak generation periods for electricity demand to*
 3 *make better use of existing grid assets.*

4 (b) *AUTHORIZATION OF APPROPRIATIONS.—There are*
 5 *authorized to be appropriated to the Secretary for carrying*
 6 *out this section \$30,000,000 for each of the fiscal years 2009*
 7 *through 2014.*

8 **SEC. 6. VEHICLE ENERGY STORAGE DEMONSTRATION.**

9 (a) *IN GENERAL.—The Secretary shall carry out a*
 10 *program of electric drive vehicle energy storage technology*
 11 *demonstrations. These technology demonstrations shall be*
 12 *conducted through consortia, which may include energy*
 13 *storage systems manufacturers and their suppliers, electric*
 14 *drive vehicle manufacturers, rural electric cooperatives, in-*
 15 *vestor owned utilities, municipal and rural electric utili-*
 16 *ties, State and local governments, metropolitan transpor-*
 17 *tation authorities, and universities. The program shall*
 18 *demonstrate one or more of the following:*

19 (1) *Novel, high capacity, high efficiency energy*
 20 *storage, charging, and control systems, along with the*
 21 *collection of data on performance characteristics such*
 22 *as battery life, energy storage capacity, and power de-*
 23 *livery capacity.*

24 (2) *Advanced onboard energy management sys-*
 25 *tems, and highly efficient battery cooling systems.*

1 (3) *Integration of such systems on a prototype*
 2 *vehicular platform, including with drivetrain systems*
 3 *for passenger, commercial, and nonroad electric drive*
 4 *vehicles.*

5 (4) *New technologies and processes that reduce*
 6 *manufacturing costs.*

7 (5) *Integration of advanced vehicle technologies*
 8 *with electricity distribution system and smart meter-*
 9 *ing technology.*

10 (b) *AUTHORIZATION OF APPROPRIATIONS.—There are*
 11 *authorized to be appropriated to the Secretary for carrying*
 12 *out this section \$30,000,000 for each of the fiscal years 2009*
 13 *through 2014.*

14 **SEC. 7. SECONDARY APPLICATIONS AND DISPOSAL OF**
 15 **ELECTRIC DRIVE VEHICLE BATTERIES.**

16 (a) *IN GENERAL.—The Secretary shall carry out a*
 17 *program of research, development, and demonstration of*
 18 *secondary applications of energy storage devices following*
 19 *service in electric drive vehicles, and of technologies and*
 20 *processes for final recycling and disposal of these devices.*

21 (b) *AUTHORIZATION OF APPROPRIATIONS.—There are*
 22 *authorized to be appropriated to the Secretary for carrying*
 23 *out this section \$5,000,000 for each of the fiscal years 2009*
 24 *through 2014.*

1 **SEC. 8. COORDINATION AND NONDUPLICATION.**

2 *To the maximum extent practicable, the Secretary*
3 *shall coordinate activities under this Act with other pro-*
4 *grams and laboratories of the Department and other Fed-*
5 *eral research programs.*

6 **SEC. 9. COST SHARING.**

7 *The Secretary shall carry out the programs under sec-*
8 *tions 6 and 7 in compliance with section 988 (a) through*
9 *(d) and section 989 of the Energy Policy Act of 2005 (42*
10 *U.S.C. 16352(a) through (d) and 16353).*

Amend the title so as to read: “A bill to provide for research, development, and demonstration programs in advanced energy storage systems for electric drive vehicles, stationary applications, and electricity transmission and distribution applications, to support the ability of the United States to remain globally competitive in this field, and to promote the efficient delivery and use of energy.”.

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A BILL

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